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Remarks

Claims 20-34 are pending and rejected. Claims 1-19 and 35-39 have previously been cancelled.

In the Office Action, the Examiner rejected claims 20-27 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement; rejected claims 20-27, 35-37, and 39 under 35 U.S.C. 103(a) as being unpatentable over Yang in view of McManomon; and rejected claims 28-39 under 35 U.S.C. 103(a) as being unpatentable over Sandler in view of McManamon. Again, please note that claims 35-39, although presently rejected, were cancelled by a previous amendment.

Remarks Regarding the Examiner's Response to Arguments

In the Response to Arguments section of the Office Action, the Examiner stated that in the Yang device, "the beam output from the source is incident upon the beam steerer according to the position the beam was output from the fiber." This statement was apparently made to support the Examiner's position that Yang teaches the limitation of "a large steering angle of the output beam being defined by a position of the source element that was selected," as recited in independent claim 20.

However, it is important to appreciate that the position of the fiber in the Yang device does not determine any steering angle whatsoever. Any difference in the output beam path caused by fiber selection in the Yang device is merely translational and not angular. This can easily be seen in Figures 1, 5, and 6 of Yang. Thus, there is no large angle beam steering due to source selection in the Yang device.

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More particularly, Figures 1, 5, and 6 of Yang clearly show no steering angle change whatsoever between fibers 12. Regardless of which fiber is providing light, the

steering angle of the light from the fiber is the same as for all of the fibers. As shown in these figures, the differences in light paths due to selection of fibers is entirely translational and not at all angular. Thus, as can be seen, all of the light paths from the fibers are parallel (there are no angular differences among the light paths).

As such, Yang does not disclose "a large steering angle of the output beam being defined by a position of the source element that was selected," as recited in independent claim 20, since Yang does not disclose that selection of a source element defines any steering angle whatsoever.

It is worthwhile to note that Figures 2, 3a-4, 7 and 8 do not show light being radiated from an array of fibers. Figures 2 and 8 of Yang show the fibers receiving light (col. 4, lines 43-48) instead of transmitting light and as such do not show the fibers defining "a plurality of source elements" (and therefore do not show "a large steering angle of the output beam being defined by a position of the source element that was selected"), as recited in claim 20.

To summarize, selecting a source element (optical fiber 12 of Figure 1) of the Yang device does not define a large steering angle (as recited in the claims) because the steering angle does not change regardless of which optical fiber is selected. By way of contrast, selecting a source element 14 (Figure 1) of the present invention does define a large steering angle because the angle between the optical axis 24 of the optics system 12 and light from the source changes substantially depending upon which of the sources 14 is selected.

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Further, in the Response to Arguments, the Examiner stated that evidence was not found in the original claims or specification that supports or teaches the large steering

angle of the output beam being defined by a position of the source element that was selected.

However, Applicant respectfully submits that teaching of a large steering angle is provided in paragraph [0018], wherein it is stated that "The collimated output of the optics system 12 may have a relatively large angular deviation, Δ_1." This large angular deviation Δ_1 or steering angle is shown graphically in Figure 1. As shown in Figure 1, this angle clearly depends upon which source element was selected.

The large angle steering is inherent in the operation of the device shown in Figure 1 of the subject patent. When a source is selected in Figure 1, a large steering angle is inherently defined by optics system 12 because the selection of the source determines the angle at which light from the source is incident upon the optics (which consequently determines the large steering angle).

Rejection of Claims 20-27 Under 35 USC 112

The Examiner rejected claims 20-27 under 35 U.S.C. 112 as failing to comply with the written description requirement. The Examiner stated that the specification fails to teach the large steering angle of the output beam being defined by a position of the source element that was selected, as discussed with respect to the Response to Arguments above.

However, Applicant respectfully submits that the specification does, indeed, teach the large steering angle of the output beam being defined by a position of the source element that was selected. This teaching is found in paragraph [0018] and Figure 1, as discussed in detail with respect to the Response to Arguments above.

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As such, Applicant respectfully submits that the rejection of claims 20-27 under 35 USC 112 is improper and should be withdrawn.

Rejection of Claims 20-27 Under 35 USC 103(a)

The Examiner rejected claims 20-27, *et al.*, under 35 U.S.C. 103(a) as being unpatentable over Yang in view of McManamon. The Examiner stated that Yang discloses "a large steering angle of the output beam being defined by a position of the source element that was selected (fiber array area in the mount)," as discussed with respect to the Response to Arguments above.

However, Applicant respectfully submits that Yang does not disclose "a large steering angle of the output beam being defined by a position of the source element that was selected (fiber array area in the mount)." Indeed, Applicant respectfully submits that according to Yang the position of a selected source element does not result in angular beam steering at all, as discussed in detail with respect to the Response to Arguments above.

As such, Applicant respectfully submits that the rejection of claims 20-27 under 35 USC 103(a) is improper and should be withdrawn.

Rejection of Claims 28-34 Under 35 USC 103(a)

In the rejection of claims 28-34 under 35 U.S.C. 103(a), the Examiner stated that Sandler discloses an optical beam steering receiver comprising "an optics (310, 312) system receiving the light from the beam steerer" and "providing an output beam (see figure 1) towards an output detector."

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However, it is worthwhile to note that the optics (310, 312) of Sandler do not direct an output beam "toward one of the detector elements according to a large steering

angle define by an angle of the light received by the optics systems," as recited in independent claim 28. Indeed, the optics (310, 312) of Sandler do not appear to direct an output beam toward one of the detector elements according any steering angle whatsoever. As shown in Figure 4, the angle of the beams (334, 316) transmitted from the optics does not appear to vary and more particularly does not appear to vary according to a large steering angle.

That is, optics (310, 312) of Sandler do not determine which detector a beam is directed toward. Each of optics (310, 312) is dedicated to a particular detector or sensor 336 and thus is incapable of directing an output beam toward a selected one of the detector elements according a steering angle.

Moreover, it is clear that the entire steering angle of the Sandler optical cross connect switch results from the beam directors 202 and 204, as discussed in paragraph [0034]. Thus, none of the steering angle results from optics (310, 312).

As such, not only does Sandler fail to teach the use of a small steering angle (see below), Sandler does not teach that the large steering angle results from "an angle of the light received by the optics systems", as required by independent claim 28.

The Examiner further stated that "Sandler fails to specifically disclose where the beam steering was for small angles." The Examiner relies upon McManamon's teaching of optical phase arrays to cure the deficiency of Sandler to disclose small angle beam steering.

The Sandler optical cross connect switch utilizes "a number of alignment beams 116" (page 2, paragraph [0026], last sentence). These alignment beams 116 cooperate

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with positions sensors 336 to facilitate alignment of the communications beams 114. Indeed paragraph [0055] on page 5 of Sandler states:

> "To provide the *best possible positioning* of communication beam 114 on lenslet 310 to maximize the light transmitted into output fiber 304, a position sensor 336 is provided to detect the position of alignment beam 116." [emphasis added]

Since Sandler specifically teaches that the "best possible positioning" of communication beam 114 is achieved using "a position sensor 336" that "is provided to detect the position of alignment beam 116," it is respectfully submitted that the combination of Sandler with McManamon is improper. One of ordinary skill in the art who is constructing an optical cross connect switch simply would not look to McManamon for small angle beams steering since Sandler already provides the "best possible positioning" of communication beam 114.

Indeed, according to Sandler, such a combination would result in decreased performance, since Sandler already provides the "best possible positioning". As such, it is respectfully submitted that Sandler vehemently teaches away from the use of McManamon's optical phased array.

As such, it is respectfully submitted that the rejection of claims 28-34 under 35 U.S.C. 103(a) is improper and should be withdrawn.

Conclusion

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None of the cited references, taken either alone or in combination with one another, either disclose or make obvious "a large steering angle of the output beam being

defined by a position of the source element that was selected," as recited in independent claim 20.

Further, none of the cited references, taken either alone or in combination with one another, either disclose or make obvious "the output beam being directed toward one of the detector elements according to a large steering angle define by an angle of the light received by the optics systems," as recited in independent claim 28.

It is further submitted that the dependent claims are independently patentable with respect to the independent claims. For example, dependent claim 24 recites the use of a wide angle lens as the optics system of claim 20. None of the prior art either teaches or suggest such use. The Examiner stated that such use of a wide angle lens is obvious "to ensure that all the beams are transmitted to the MEMS array and not lost." However, optics systems can certainly be designed such that all of the beams will be transmitted and not lost without the use of a wide angle lens. The wide angle lens is used according to the present invention to facilitate large angle beam steering, not to assure transmission without losing beams.

In view of the foregoing, it is respectfully submitted that claims 20-34 are in condition for immediate allowance. Reconsideration and an early allowance is therefore respectfully requested.

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If the Examiner has any questions or concerns, a telephone call to the undersigned at (949) 752-7040 is encouraged.

Certification of Facsimile Transmission

I hereby certify that this paper is being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Saundra L. Carr — Date of Signature: 4-27-07

Respectfully submitted,

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